Thus, Applicants respectfully submit that the objection to the Abstract has been overcome.

Specification:

On pages 3 and 4 of the Office Action, the Specification was objected to for informalities. A substitute specification was required before the application passes to issue. Applicants are preparing a substitute specification to correct the informalities. The substitute specification will also include the amendments previously requested in the Preliminary Amendment submitted with the filing of the patent application.

The substitute specification will be submitted prior to issuance of the application.

Claim Rejections – 35 U.S.C. § 103:

On pages 4-7 of the Office Action, claims 1, 5, 7, and 10-12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Masao (JP 61-261481) in view of Hitomi et al. (JP 3-158469), and Takahiro et al. (JP 63-286570). On page 7 of the Office Action, claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Masao in view of Hitomi et al. and Takahiro et al., and further in view of Collison et al. (US 6,203,657). Applicants respectfully disagree.

Applicants' invention, as claimed in claim 1, pertains to a surface treatment apparatus for generating plasma by plasma generating electrodes in a casing having plasma generating electrodes, a raw-gas inlet and a substrate supporting table, plasma ionizing the raw gas and plasma processing a surface of said substrate, which is mounted on said substrate supporting table. Claim 1 calls for said casing to be partitioned to two chambers, that is, a plasma generating chamber provided with said plasma generating electrodes and a substrate processing chamber provided with said substrate supporting table. Claim 1 has been amended to clarify that one of the plasma generating electrodes separates the plasma generating chamber from the substrate processing chamber. Claim 1 further calls for said substrate processing chamber to communicate with said plasma generating chamber through at least one plasma vent which is formed at said one of the plasma generating electrodes. Claim 1 has been amended to clarify that the substrate processing chamber communicates with said plasma generating chamber through at least one plasma vent which is formed at said one of the plasma generating electrodes. Claim 1

also defines the electrodes, which are disposed so as to interpose a plasma flow spurted out from the plasma vent therebetween, are provided in and between the vicinity of said plasma vent and the vicinity of said substrate supporting table.

Applicants respectfully submit that Masao, Hitomi et al., and Takahiro et al., alone or combined together, do not disclose or suggest Applicants' invention, as claimed in claim 1. Particularly, those references do not disclose or suggest "a plasma generating chamber provided with said plasma generating electrodes and a substrate processing chamber provided with said substrate supporting table, one of the plasma generating electrodes separates the plasma generating chamber from the substrate processing chamber" and "at least one plasma vent which is formed at said one of the plasma generating electrodes."

Therefore, Applicants respectfully submit that Applicants' invention, as claimed in claim 1, would not be obvious to one of ordinary skill in the art in view of Masao, Hitomi et al., and Takahiro et al., either alone or in combination. Furthermore, Applicants submit that dependent claims 5, 7, and 10-12 are also allowable for the above reasons and because of their dependency from claim 1.

As to claim 8, Applicants further submit that Collison et al. does not remedy the deficiencies of Masao, Hitomi et al., and Takahiro et al.

Thus, Applicants respectfully submit that the §103(a) rejections have been overcome.

CONCLUSION

For the foregoing reasons, Applicants respectfully submit that the patent application is in condition for allowance and request a Notice of Allowance.

Respectfully submitted,

BELL, BOYD & LLOYD LLC

BY 

Michael S. Leonard
Reg. No. 37,557
P.O. Box 1135
Chicago, Illinois 60690-1135
Phone: (312) 807-4270

Dated: January 6, 2003

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

1. (Twice Amended) A surface treatment apparatus for generating plasma by plasma generating electrodes in a casing having plasma generating electrodes, a raw-gas inlet and a substrate supporting table, plasma ionizing the raw gas and plasma processing a surface of said substrate, which is mounted on said substrate supporting table; ~~characterized in that~~ wherein

said casing is partitioned to two chambers, that is, a plasma generating chamber provided with said plasma generating electrodes and a substrate processing chamber provided with said substrate supporting table, one of the plasma generating electrodes separates the plasma generating chamber from the substrate processing chamber;

said substrate processing chamber communicates with said plasma generating chamber through at least one plasma vent which is formed at said one of the plasma generating electrodes; and

the electrodes, which are disposed so as to interpose a plasma flow spurted out from the plasma vent therebetween, are provided in and between the vicinity of said plasma vent and the vicinity of said substrate supporting table.

5. (Twice Amended) A surface treatment apparatus according to ~~any one of claims~~ claim 1 ~~to 3~~, wherein high frequency electric power is inputted to said plasma generating electrodes.

7. (Twice Amended) A surface treatment apparatus according to ~~any one of claims~~ claim 1 ~~to 3~~, wherein said plasma vent has a required orifice shape or a nozzle shape.

8. (Twice Amended) A surface treatment apparatus according to ~~any one of claims~~ claim 1 ~~to 3~~, wherein said raw-gas inlet defines an opening on a side face of said plasma vent.

10. (Twice Amended) A surface treatment apparatus according to ~~any one of claims~~ claim 1 ~~to 3~~, wherein said plasma vent has a circular section.

11. (Twice Amended) A surface treatment apparatus according to ~~any one of claims~~ claim 1 ~~to 3~~, wherein said plasma vent has a slit shape.

12. (Twice Amended) A surface treatment apparatus according to ~~any one of claims~~ claim 1 ~~to 3~~, wherein said substrate is given with electric potential.